

### REMARKS

The Applicant summarizes the March 10, 2004 Office Action as follows. The Examiner rejects claims 1-8, 10-17 and 20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,676,246 (Anderson et al.). Most heavily, the Examiner relies on Anderson's claim 10 which, in relevant part, recites:

10. A method for printing with an ink jet printer, comprising the steps of:

... providing a thermal ink jet print head . . . having a plurality of heating elements, each heating element including a heating resistor.

... *applying a pulse time* of less than about 0.73 microseconds *to each heating resistor to achieve ejection of the ink through the nozzle at an energy per unit volume of heating element ranging from about 2.9 GJ/m<sup>3</sup> to about 4.0 GJ/m<sup>3</sup>*, wherein the volume of the heating element is determined by the area of the heater resistor multiplied by the sum of the thickness of the heater resistor and the thickness of the protective layer, and ejecting droplets of ink at a stable velocity onto a print medium.

Claims 9, 18 and 19 stand rejected as obviousness-type double patenting variants over claims 1-19 of Anderson in further view of Prasad et al. (6,309,052). Thus, all claims stand rejected under obviousness-type double patenting in view of Anderson, especially claim 10, alone or in combination with other art.

The Applicant does not disagree that inkjet printheads of the past, including Anderson, have ejected ink in stable ink jetting energy ranges. The Applicant does not disagree that inkjet printhead heaters have a given thickness and area. The Applicant does disagree, however, that any prior art inkjet heaters first had their thickness and area calculated and then a stable ink jetting energy range predicted based upon a calculated heater thickness and area. In other words, the

prior art simply determines what their input or heater structure (e.g., film thickness, shape and area) should embody for a given output (e.g., desired heat per hour). Yet, in the reverse, they do not and cannot determine their given output based upon their input. Namely, they cannot determine what their desired heat per hour will be if all they know is their heater thickness, material, shape and/or area. That, however, is exactly what the inventors of the instant application can, in fact, predict or foretell. Namely, they can predict what the output (e.g., stable ink jetting range) will correspond to for a given heater structure input (e.g., thickness and area). For this reasoning, the Applicant submits the patentability of all pending claims. As you can see in bold-italics above, Anderson merely claims “applying” a pulse to heating resistors “to achieve ejection of the ink” at a given energy per unit volume. This is not, however, the claimed step of “predicting” or “foretelling” and should not be used to render the pending claims as obviousness-type variants.

As the Examiner is undoubtedly aware, the primary issue in all obviousness-type double patenting rejections is “whether the claimed invention in the application for the second patent would have been obvious from the subject matter of the claims in the first patent, in light of the prior art.” *In re Longi*, 759 F.2d 887, 892. As evidenced above, a clear distinction exists in the claim language of the two patents. Namely, Anderson “applies” energy to a heater with a given volume (thickness and area) and “achieves” a result. Whereas, the current invention requires the advance thought of the operable energy range of a heater chip. As a result, printhead manufacturers will no longer need to test heater chips to determine the optimal energy operating range. Instead, they will be able to predict the optimal energy operating range prior to completion of the chip, eliminating the possibility that an already-developed heater chip will avoid meeting a preferred operating range.

In addition to the distinctions found in the claim language, the language found in the written description of the two patents further distinguishes the inventions. Anderson states “[t]he invention relates to a heater construction that enables a reduction in the pulse time and the energy applied to the heaters, and thus achieves heater structures more suitable for providing ink jet printers having an increased number of ink ejection nozzles and an increased heater firing frequency.” *Anderson (6,676,246) col. 1: 44-58*. Although the patent later mentions an operable energy per unit volume, *Anderson (6,676,246) col. 1:49-54*, nothing in the written description mentions the prediction, or foretelling of an energy operating range. In contrast, the written description of the current invention specifically discloses multiple experiments and data analyses which culminate as follows:

Advantageously, the relationship can now be understood between an individual heater’s geometry (i.e. its width, WH, length, LH, and thickness, TH), regardless of the compositions of the layers, and the energy required to stably jet the heater. As a result, for a given heater area and thickness, an energy range can be consistently predicted that results in stable ink jetting performance. *Applicant’s Specification pgs. 12-15*.

Finally, the Applicant also asserts the combination of Anderson and Prasad fails in rendering the claims obviousness-type variants because neither reference implicates the forehand “prediction” or “foretelling” or otherwise predetermining a stable ink jetting energy range based upon a given input of a heater thickness and area.

Appl. No. 10/619,968  
Response dated June 9, 2004  
Reply to Office Action of March 10, 2004

The Applicant believes that all pending claims stand in a condition for allowance. If the Examiner disagrees, however, he is invited to contact the undersigned representative at the number listed below in order to reduce costs and expedite the issuance of this patent. Also, it is believed no fees are due, but should any be required, the undersigned authorizes the deduction from Deposit Account No. 11-0978.

Respectfully submitted,

**KING & SCHICKLE PLLC**



Michael T. Sanderson  
Registration No. 43,082

247 North Broadway  
Lexington, Kentucky  
(859) 252-0889

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the  
United States Postal Service as first class mail in an envelope addressed

to: Commissioner for Patents, P.O. Box 1450,

Alexandria, VA 22313-1450, on

by June 9 2004  
6-9-2004 Carolina Perdomo